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Internet Searching and other Research Challenges: Publish or Perish?

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by Professor Melius Weideman

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Citation of Professor Melius Weideman

Melius Weideman was born in 1956 in Tarkastad, and matriculated at the Robertson High School. He is currently a Head of Department in the Faculty of Informatics and Design, and runs the Research Development Department. On 1 November 2008 he completed 24 years of unbroken service at CPUT.

He always had an interest in what he considered to be things of an engineering and technical nature, and initially completed a four-year National Higher Diploma in Electronic Engineering. Thereafter a number of years was spent in industry, working for the Council for Scientific and Industrial Research, AECI, Anker Data Systems and Customer Engineering (Wang computers). These occupations involved electronic design and faultfinding, customer liaison and computer maintenance. He showed an early interest in designing systems, and established an effective support group for large computer customers in the Western Cape.

During 1983 he started part-time lecturing in Information Systems, and joined the then Cape Technikon in 1984 as a full-time lecturer. The advent of the first computer virus programs caught his attention and spurred him on to a first research venture. He completed his Master’s qualification in 1994, focusing on the effect these viruses have on computer files.

His school sport interests grew from cross-country running into participation in longer events, and he has completed two Comrades, three Karoo, two Two Oceans and numerous other ultra- and standard marathons. However, a knee injury forced him to find another sport, and cycling was a natural choice.

He has always been a forerunner with new ideas, and implemented a basic content delivery system just after the faculty installed its first Novell network. This was before learner management systems like WebCT and the Internet as we know it today were available. He used a simple website to provide learning materials for his students, and later replaced class announcements with e-mail, a new phenomenon at the time, designed to communicate with students.

The Internet was born midway through his 17 years of lecturing. He was fascinated by the large volumes of information available on this new medium, and frustrated by the difficulty of finding relevant information quickly. This led to experimentation with search engines and information retrieval, and in 2000 he was named the Best New Researcher of the Year. Subsequently he graduated with a Doctorate in Information Science from the University of Cape Town in 2001. He has managed to find a way to assist students in finding study-related material easily through the correct application of search engine technology.

At the turn of the century he started focusing more on research, and in the relatively short time span of seven years has produced a large number of local and international journal and conference publications. He has also had success with research funding ventures and mentoring postgraduate students. Lately he pioneered the
publication of academic working papers of BTech students in three academic publications.

In parallel with these academic developments, he served the university on many administrative fronts. He was an acting Head of Department in various capacities before being appointed as a full HOD in 2004. During this year he chaired a committee which arranged the first CPUT Research Day, and in 2005 he chaired the hosting committee of an international conference in Cape Town. He also serves on many other university planning and decision committees, including: CONFCOM, Senate Research Committee, CPUT Senate, Faculty Research Committee and the Anti-Plagiarism Committee. He is also the Faculty Research Coordinator for FID, which involves the management of the Department of Education research submissions, recording research progress, management of research finances and in general representing the Faculty’s research matters. He has just established a Funding One-Stop Shop inside the Faculty, where assistance is given to junior researchers to find their way through the maze of research funding opportunities and applications.

Melius is the head of a very productive Research Niche Area of the National Research Foundation, consisting of between three and eight active researchers. This NRF RNA titled: ICT in e-Business, e-Government and Community Engagement for Shared Growth has received more than R3.3m of research funding under his guidance since 2002.

The expected research output per academic per year for a University of Technology is 0.5 Department of Education units, while for a traditional university it is 1.25 units. Melius’s actual figures are 3.25 units for 2004, 4 for 2005, 7.5 for 2006 and 3.75 for 2007.

CPUT invests heavily in research, and Melius designed and implemented a simple but effective web-based system to manage the process of applying for and allocating university research funding. He has peer reviewed numerous journal articles, conference papers, research funding applications and other research documents; moderated university examination papers; examined postgraduate theses; and has served as session chair at a number of local and international conferences.

Melius has a strong international presence, and has delivered a number of guest lectures over the years. These include those at two of the world’s top ten universities: Oxford in the UK and Columbia in the USA. Others include:
- Wolverhampton, Hull and Durham Universities (all UK),
- Technische Universitat Munchen, Vrije Universiteit Amsterdam,
- Johann Wolfgang Goethe University Frankfurt, University of Maribor Slovenia (all Europe) and
- United Arab Emirates University, Al Ain, UAE.

Campus02, in Graz, Austria invited him to do two workshop series on Internet Marketing through Websites in 2008.
During 2007 he was chosen from 40 international applicants to become the first Fellow at the Munich University of Applied Sciences. In mid-2008 he spent three months teaching and doing research at this university. During this period he also completed an academic book titled: Website visibility: the theory and practice of improving rankings. This book will be published by Chandos of Oxford in December 2008. He also actively manages two websites: one to promote this book, and another to make research funding and resource information easily available to colleagues and students.

The University of Malaysia has for the past four years appointed Melius as an Adjunct Professor. He is also a member of local and international professional societies, including the:
- Computer Society of South Africa,
- South African Institute of Computer Scientists and Information Technologists,
- Information Resources Management Association and
- International Association for Development of the Information Society.

University of Technology research should have value to government and industry. To this end Melius has been involved with a number of outside companies, resulting in both academic publications and tangible outputs of value to industry. He has collaborative links with local companies representing South African law, industrial manufacturing, government service delivery, medical practice and even cycling event management.

Melius believes in capacity building, and spends time in uplifting junior researchers as well as post-graduate students through offering courses, consultation and leading by example.

Melius lives in Protea Valley, enjoys spending time with his family and for recreation cycles, reads and dines out. A high-speed fall during the 2008 Cape Epic 960km multi-stage event prevented him from finishing and resulted in a three-day hospital stay. He is currently registered for the 2009 event. He has completed four Double Centuries and 15 Argus Cycle Tours to date, plus numerous shorter fun rides.
Published Works

JOURNAL ARTICLES


ACADEMIC BOOKS AND CHAPTERS


POSTGRADUATE STUDENTS


**CONference Papers**


INTERNET SEARCHING AND OTHER RESEARCH CHALLENGES: PUBLISH OR PERISH?

Dale Carnegie has claimed that one can win friends and influence people in 12 different ways in his groundbreaking 1936 book. Tonight I will use number 13 – make short speeches!

Allow me to welcome and thank the CPUT Executive Management, my colleagues, friends and family for sharing in this joyous occasion. My address is written out in detail in the booklet available outside, and whatever I skip during the presentation, you may catch up on during your bedtime reading later tonight. I would like to cover some academic matters and progress in my field of research, as well as life lessons I have learnt over the years.

The definition of “Publish or Perish” which follows is taken from Wikipedia, and in referring to it I open myself up for criticism from some academics. One school of thought is that Wikipedia, and other mass collaboration initiatives, are of an inferior quality and should never be cited. Fortunately, this address will not be peer reviewed for journal publication, so I have chosen to follow the second school of thought: use Wikipedia for basic definitions when it suits you, but do not base any serious scientific arguments on it.

“Publish or perish” refers to the pressure to publish work constantly in order to further or sustain one’s career in academia. The competition for tenure-track faculty positions in academia puts increasing pressure on scholars to publish new work frequently.

However, no mention is made in this definition of the hunger for more knowledge, the solving of real-life problems, or the building of character. By the end of this evening, I hope to have shed new light on this contentious issue.

SEARCH ENGINES

As we all know, the growth of the Internet since its inception 18 years ago has had an enormous impact on our lives on many fronts. Email use has grown to become the biggest so-called “killer application”, with Internet searching a close second. As a result, search engine usage and economics have been in the news, especially since around 2000. The phenomenal rise of Google stocks from a mere $85 in 2004 to over $700 last year, currently sitting at $400, is ample proof of this trend. Who will forget Microsoft trying to take over Yahoo! for $31 per share – a transaction worth over $44 billion? Why would anybody pay this kind of price for a company that does not charge anything for its basic service, but has millions of visitors each day? It does sound rather strange.

There have been rumours that Microsoft was not really trying to purchase the search technology of Yahoo!, but they were courting the 500 million users of Yahoo!’s email product. Some simple arithmetic will show why this is such a lucrative market. Assume that only 1% of the 500 million users will respond to one of the endless advertisements facing them per day, and another 1% of the first 1% actually purchases a product from that advertisement. This equates to a rather low response of one out of every 10 000 users. Further assume that these transactions yield a profit of $1 each. This will produce a breathtaking profit of a $50 000 per day. When one participates in a cycle race, it would be foolish to ride
the whole distance alone. The wise thing to do is to find a group of riders of the same ability as yourself, and to sit in their slipstream, saving approximately 40% of your energy in the process. Experiments have shown that just two riders alternating the wind-breaking position can drop the rear cyclist’s heart rate by 22 beats per minute. In the same way, it appears to be wise to side with the forerunners in the search market, and to hide in their wind shadow. Currently Google, Yahoo! and Live Search together contribute 92.7% of the total traffic generated by search engines. The Big Three have taken over and are monopolising the search market. This situation is unlikely to change in the short term. However, the competition is fierce and in the longer term there are likely to be some shake-ups in the market. The chase to take on the Google Giant is still on; mergers and/or takeovers between the likes of Microsoft, Yahoo!, Ask and Lycos are likely.

I have still not addressed the issue of how search engines are able to be so profitable. How did Google manage to maintain their financial growth over such a relatively long period of time? After all, their most basic product – Internet search – is free of charge! Enter SEM - search engine marketing. Search engine users are impatient and want the correct information right now, at the top of the screen, not hidden away somewhere in a long list of possible answers. This has resulted in an almost unhealthy focus on the top part of a screen with search results. Users are likely to respond only to what they can see above the fold on the first screen of results. Research has proved that an average of 67% of users will read just the first page of results, while only 9% will read past the third page. The implication is that if a website is not listed on the top half of the first page of results, it is virtually invisible as far as the average user is concerned.

**WEBSITE RANKINGS**

Website owners have two ways to improve the ranking of a website. Either, design a website in a certain way using a process called Search Engine Optimisation, and wait for the search engines to increase its ranking in the naturally harvested results. Alternatively, make use of a paid system where the owner places a bid on a keyword or key phrase, and pays the bid amount every time a user clicks on that link. This way an owner can be sure that the website will appear right on top of the listings, if his/her bid is the highest.

This second system is the main source of income for search engines. Many website owners the world over are making a decent living by advertising their products or services on paid search engine listings, while the search engines are laughing all the way to the bank. The owner of one of South Africa’s search engines has made no secret of the fact that they are not really interested in searching – they are simply using searching as a hook to draw advertisers and users to make use of their services.

**EMAIL**

Back to email! I would like to challenge the IT management of CPUT to take a brave step forward towards improving service delivery to the academic fraternity they are serving. The university student market is lucrative – where else do you find large numbers
of young, intelligent consumers, dependent on technology? They are already users of email, Internet searching and social networking like Facebook and Myspace. They are all potential high earners. Within five or six years of starting their studies, they will already have an impact on their work environment with their own preferences, background and influence in general. They are a market just waiting to be tapped into…

All universities must and do offer their students a unique university email address. This is arguably the most often used university resource, and implies the purchase and maintenance of a complex and potentially troublesome email program. “Complex” since it should be capable of supporting tens of thousands of users and offer many features required by these users. “Troublesome” since abuse must be measured and managed. Other problems include bandwidth consumption due to large attachments and lengthy downloads, and space to store millions of messages.

Most students, by the time they enrol at a university, already have their own third-party email address. Many world universities have started asking the question: “Why force students to use yet another email account, when they have and use one of their own choice already?”

Enter some solid business decisions. A perfect example of how large Search Engine companies are cashing in on this market is the switchover that many universities have made in terms of email. Instead of purchasing and maintaining a massive university email system, the university simply uses one of the many free systems on offer, mostly from search engine companies. This cuts down on the tremendous overheads and complexity of running one in-house.

Some universities having done this include Austin College, Arizona State University (65 000 students), Mesa Community College, University of Southern California, Bradley University, Trinity College Dublin, Linkoping (26 000 students).

My challenge to the IT Management of CPUT is: have you considered dropping the slow and unpopular university email system in favour of one of these schemes? The savings in manpower and overheads could be enormous. The levels of service delivery could improve dramatically.

Closer to home, Google has forged links with universities in Egypt, Rwanda and Kenya. They have all opted for Google’s education package, which is an indication of the democratising nature of the online world. Students now have access to free online tools allowing them to share files in real time, use online calendars and timetables. All of this is available without the university’s having to invest in IT overheads.

RESEARCH

A group of researchers at the Shanghai Jiao Tong University in China is spending much research time on maintaining a list of the top 500 universities in the world. They base their measurements on a combination of six factors, each one with a weight of 10 or 20%. Some of these factors are the number of alumni and staff having received Nobel prizes, the number of research articles published in well-known journals, and academic performance with respect to the size of the university.

The top ten include eight universities from the USA and two from
the UK. The first five are Harvard, Stanford, University of California-Berkeley, Cambridge University and the Massachusetts Institute of Technology. South Africa does not do too well on this list. CPUT is not present. The following four South African universities appear on the list from 2003 to 2007, with one dropping out in 2008. The University of Cape Town leads the rankings with a place in the 200–300 category over all six years. The University of the Witwatersrand and KwaZulu-Natal make up the other two in the 2008 list, while the University of Pretoria dropped off in 2008, despite being there for the past five years.

How can we get ourselves onto this list? This is a question that is easy to answer but a vision difficult to implement. Publish or Perish! All academics should publish research results on a regular basis; however few do so. A commendable effort towards this goal is the R20 million that CPUT has recently set aside on a tender system for Research and Innovation Centres. We are eagerly awaiting the outcome of this process. CPUT also has a total of seven NRF research niche areas – one fewer than UCT, UP and US combined. We are on the right track in terms of national research funding and support initiatives.

I would like to challenge our young researchers in a united effort towards getting CPUT on this list. One approach would be to learn from Africa’s wild animals. Many of them are territorial, and use various ways of delimiting these territories. Leopards spray their perimeters with their own urine, while rhinoceros use dung. They dig a shallow hole, and use it over a period as a dung repository. After every visit, they will walk through this area and then patrol their perimeters, laying down their boundaries with fresh dung. In the same way a young researcher should decide on his/her academic interests, and narrow it down to a specific field. This delimitation enables the researcher to focus on quality research outputs, and helps prevent straying into too many interesting but dispersed topics of research. Seek the advice of a senior researcher before making this all-important decision. It will shape the rest of your academic career.

You should also start early to build your own career while serving the interests of your university. I would like to use an illustration to help you in this process. When you start your academic career, it is like walking into a room with just a table as the only furniture. The table is your expertise in a certain field – it is a given, and it must be in place before your becoming an academic. On the table there are eight empty buckets. If you want to build a successful academic career, you should at least cover the bottoms of all the buckets. The buckets are, in no particular order:

- teaching experience,
- journal article publications,
- conference proceeding publications,
- book/chapter publications,
- supervision of postgraduate students,
- research funding applications,
- contract research and
- administration and service functions.

After a decade or so, some buckets might overflow, others might be half full, but none should have their bottom visible. Filling these buckets will become an approach to life, a purposeful methodology and a structured road to moving CPUT into the Shanghai University list.
This process is similar to training for the Cape Epic multi-stage, extreme cycle race. When you wake up out of your winter sleep fitness-wise, you have just your body, but no endurance or power. You have to cover the bottoms of all the buckets before the start – physical fitness, bike preparation, single-track negotiating skills and of course mental preparation. You cannot survive eight or nine days of torture on cookies and water, on a bicycle with old tyres and only one gear.

UNIVERSITY

While on the topic of our university, I have some advice for our much needed service departments. I am referring to Finance, IT, Building maintenance, Student registrations, etc. Remember, your task is to support academics, so that we can keep our customers (the students) happy. These customers, and partially the government, pay our salaries. Academics are there to nurture and support students, and to save universities from becoming outdated, superfluous and even from being closed down. Service departments are there to enable academics, not control them.

I would like to share a thought with my university management. The world is full of experts in many fields who can and do become lecturers. These lecturers are an essential part of any university system, and they should be looked after. However, very few academics in most universities have the skills to be or interest in becoming productive researchers. You cannot take any baboon and make him/her a researcher; you need a special kind of baboon. Treat your researchers like kings, and they will reward you with pots of gold.

Another word to all CPUT students: past, present and future. You are the future of our rainbow nation, you will be the middle level managers 10 years from now, you will lead our country 30 years hence. He who asks a silly question may be a fool for 5 minutes. He who does not ask questions at all will remain a fool for the rest of his life. Challenge what you learn, and never complain about what you have to do towards building your own future. The world owes you nothing – you owe everything to the world to prove your value. During my three months of lecturing at a Munich university earlier this year, not once did a student approach me with an excuse for not meeting a deadline, or with a request to treat him or her differently from the others. This was quite an eye-opener to me, and I would like to see this approach amongst our own students. While you are a student, you are a follower of leaders. Within a decade you should become a leader of followers, and eventually a leader of leaders. Working hard during your studies at a university is not an exception to the rule, it is necessary for survival. By being enthusiastic, dedicated and acting with integrity you are bettering your chances of finding gainful employment later. Consider these words which I found stuck to a wall in the small town of Urk in the Netherlands:

*Er zijn drie manieren om verstandig te leren handelen. De eerste, dat is de edelste, door nadenken. De tweede, dat is de makkelijkste, door navolging. De derde, dat is de bitterste, door ervaring…*

There are three ways to learn how to act wisely. The first and most noble, is through thinking. The second and easiest is through following another’s example. The third, which is the most difficult, is through experience....
EXCELLENCE

The organising committee of the Beijing Olympics had to select 380 hostesses from thousands of applicants to present the prizes at the 2008 Games. They had to learn to keep their knees together, stand perfectly straight and smile permanently, showing between six and eight teeth. A piece of paper between the knees, a book balanced on their heads and clamping a chopstick between the teeth while spending hours per day in front of a mirror did the trick.
I have a friend who owns a rather expensive motorcar. This car refuses to close the boot if the keys are inside, and supports the passenger’s bodies with flaps continually adjusting against their sides as it moves around corners.

These are both examples of excellence in planning and design. The top world universities like Harvard, Oxford and MIT earned their positions through excellence in everything they do. A university is defined by its students, administrative and academic staff. If you are in one of these categories, my message to you is to tackle this journey towards excellence. If you do, CPUT will be on the Chinese university list within 10 years.

James Hynes wrote a book titled: Publish or Perish: Three Tales of Tenure and Terror. So far I have tried to elucidate this concept. Although many critics condemn the trend towards publicising one’s research work through approved channels, there is currently no acceptable alternative to measuring the value of research. I have to conclude that academics will continue to prove their worth by:

- doing research,
- writing it up in a standardised fashion,
- having it peer reviewed (however painful the process might be),
- and having it published.

Long live “Publish or Perish”!

THE FUTURE

Many famous personalities have made a number of statements which they probably regretted afterwards. Some of them follow.
In 1899 a commissioner of the US Office of Patents stated that there could be no more new inventions – everything that could be invented, had been invented.

The future of the radio was not given much chance of success, when David Sarnoff claimed in 1920 that it had no imaginable commercial value. “Who would pay for a message sent to nobody in particular?”

A professor in economics at Yale University believed that, during 1929, stocks had reached what he called a “permanently high plateau”.

Even Albert Einstein believed in 1932 that nuclear energy was only a dream, since it implied that the atom would have to be divided.

Thomas Watson, the president of IBM, claimed in 1943 that there was likely to be a world market for a total of five computers.

The highly acclaimed Popular Mechanics magazine estimated
in 1949 that computers in future would weigh no more than a mere 1.5 tons.

Ken Olson, president of a large computer company (DEC), stated in 1977 that there was no reason for an individual to have a computer in his home.

Bill Gates claimed in 1981 that 640kB of memory was more than anybody would ever need. Entry-level computers today are sold with over 3 000 times that amount of memory.

An important lesson to learn from these sorrowfully off-target predictions is that guessing about future technological trends is dangerous. However, I would like to venture into the unknown by making some educated guesses about future trends. I do believe that there will be a move away from text-only search to richer applications. Humans are lazy and do not like reading more than a few lines of text at a time, certainly if it appears on a website. The traditional taboo of “search engines cannot index images or videos” is disappearing. Google has just released GAudi - a system that extracts text from YouTube videos. This means you can now search for spoken words or phrases on a video which is available on the Internet.

The revenue produced via online advertisements is unlikely to continue in its current trend. This figure, for the USA alone, was $11.5b for the first six months of 2008, compared with $10b for the same period in 2007. The current downturn in the world economy will not leave these amazing figures untouched, and we will probably see a decrease over the next two years.

The long-awaited release of Apple’s i-Phone in South Africa had barely happened, when Google soon thereafter released its own new mobile phone. Beneath the covers, this heralds a new fight for dominance between mobile operating systems: Windows Mobile, as used by HP and other PDAs, Nokia’s Symbian and now Google’s Android. Android is an open-source operating system, which is likely to give further impetus to the move towards semi-coordinated mass collaboration.

I sincerely hope that, 20 years from now, nobody will quote any of these predictions of mine the way I have just done with others.

CLOSING

In closing, I would like to focus on even more important human issues. My very recent research has proved that one factor influencing the visibility of a website to search engines stands out as being by far the most important. This is the quality and quantity of inlinks – other websites which refer to yours through a hyperlink. Search engines use these inlinks as votes of confidence in your website, hence their value in determining the ranking of search results. I believe that this is also true for the way we value people. A person who has earned the respect of others through his or her actions, character and integrity, who has reached out to the less fortunate, is worthy of high value. The opinions of others can be viewed as votes of confidence. Landa Cope has some thoughts about character and how we choose leaders. She states that the Western culture seems to favour what a person owns, what he does or his status. The African culture, however, focuses more on what other people
think about a person’s character, wisdom, understanding and respectability. Political power and money are not listed as criteria. The Bible supports this African view.

A quote from Bernard Baruch puts this into perspective:

_During my 87 years I have witnessed a whole succession of technological revolutions. But none of them has done away with the need for character in the individual, or the ability to think._

May you be blessed by the God above all Gods as you continue with the rest of your life when you leave this room. I thank you for your time and attention.

REFERENCES


